

AMENDMENT

Kindly amend the application, without prejudice, without admission, without surrender of subject matter and without any intention of creating any estoppel as to equivalents, as follows.

IN THE CLAIMS:

Kindly amend the claims, without prejudice, without admission, without surrender of subject matter and without any intention of creating any estoppel as to equivalents, to read as follows:

1-36. (Cancelled)

37. (Previously Presented) A method of depositing a material onto a substrate, the method comprising the steps of:
pressure feeding a material solution comprising one or more precursor compounds and a solvent from a material solution supply to an outlet;
generating an electric field between the outlet and a substrate to provide a corona spray of droplets of the material solution and electrostatically guide the droplets from the outlet towards a surface of the substrate; and
providing a decreasing temperature gradient from the surface of the substrate to the outlet.

38. (Previously Presented) A method according to claim 37, wherein the step of generating an electric field comprises the step of applying a voltage to the outlet such that droplets of the material solution emerging from the outlet are charged and attracted to the substrate by virtue of the electric field.

39. (Previously Presented) A method according to claim 37, comprising the step of relatively rotating and/or translating the outlet and the substrate during the method.

40. (Previously Presented) A method according to claim 37, comprising the step of varying the material solution composition and/or concentration during the method.

41. (Previously Presented) A method according to claim 37, comprising the step of reversing the polarity of the electric field between the outlet and the substrate at intervals during the method.

42. (Previously Presented) A method according to claim 37, comprising the step of locally heating areas of the substrate to enhance material deposition at the heated areas.

43. (Previously Presented) A method according to claim 37, comprising the step of electrostatically and/or magnetically steering the stream of droplets in transit from the outlet to the substrate.

44. (Previously Presented) A method according to claim 37, wherein the material is deposited as a film.

45. (Previously Presented) A method according to claim 44, wherein the film is a multicomponent oxide film, a simple oxide film or a doped film.

46. (Previously Presented) A method according to claim 44, wherein the film is one or more of a structural film, a functional film and an electroceramic film.

47. (Previously Presented) A method according to claim 37, in which the material is deposited as a powder.

48. (Previously Presented) A method according to claim 37, in which the material solution is a polymer solution.

49. (Previously Presented) A method according to claim 48, comprising the step of maintaining the applied electric field for at least part of the time during which the material deposited on the substrate is allowed to cool.

50. (Previously Presented) A method according to claim 37, wherein the material solution further comprises a pH-modifying catalyst.

51. (Previously Presented) A method according to claim 50, wherein the catalyst is an acid, added in sufficient quantity to give a material solution pH of between 2 and 5.

52. (Previously Presented) A method according to claim 51, wherein the catalyst is selected from the group consisting of ethanoic acid and hydrochloric acid.

53. (Previously Presented) A method according to claim 50, wherein the catalyst is an alkali, added in sufficient quantity to give a material solution pH of between 9 and 12.

54. (Previously Presented) A method according to claim 53, wherein the catalyst is NH_3 .

55. (Previously Presented) A method according to claim 37, wherein the droplets of material solution are charged to approximately 5 to 30 kV with respect to the substrate.

56. (Previously Presented) A method according to claim 37, wherein the temperature decreases to a temperature in the approximate range from about 650 to about 100 °C.

57. (Previously Presented) A method according to claim 37, wherein the temperature decreases to a temperature in the approximate range from about 400 to about 100 °C.

58. (Previously Presented) A method according to claim 37, wherein the method is performed within the confines of a container and gaseous reactants are supplied to the container, to enable deposition of a film.

59. (Previously Presented) A method according to claim 37, wherein the material is Lead Zirconate Titanate (PZT), and the material solution is manufactured by the steps of:

- (a) mixing $\text{CH}_3\text{OCH}_2\text{CH}_2\text{OH}$ (solvent) with a first precursor compound $\text{Pb}(\text{CH}_3\text{CO}_2)_2$ and $\text{Zr}(\text{OC}_3\text{H}_7)_4$ and a second precursor compound $\text{Ti}(\text{OC}_3\text{H}_7)_4$, and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

60. (Previously Presented) A method according to claim 37, wherein the material is PbTiO_3 , and the material solution is manufactured by the steps of:

- (a) mixing $\text{CH}_3\text{OCH}_2\text{CH}_2\text{OH}$ (solvent) with a first precursor compound $\text{Pb}(\text{CH}_3\text{CO}_2)_2$ and a second precursor compound $\text{Ti}(\text{OC}_3\text{H}_7)_4$, and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

61. (Previously Presented) A method according to claim 37, wherein the material is BaTiO_3 , and the material solution is manufactured by the steps of:

- (a) mixing $\text{CH}_3\text{OCH}_2\text{CH}_2\text{OH}$ (solvent) with a first precursor compound $\text{Ba}(\text{CH}_3\text{CO}_2)_2$ and a second precursor compound $\text{Ti}(\text{OC}_3\text{H}_7)_4$, and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

62. (Previously Presented) A method according to claim 37, wherein the material is $\text{SnO}_2\text{-In}_2\text{O}_3$, and the material solution is manufactured by the steps of:

- (a) mixing ethanol (solvent) with a first precursor compound $\text{In}(\text{NO}_3)_3 \cdot x\text{H}_2\text{O}$ and a second precursor compound SnCl_2 , and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

63. (Previously Presented) A method according to claim 37, wherein the material is $\text{La}(\text{Sr})\text{MnO}_3$, and the material solution is manufactured by the steps of:

- (a) mixing about 20% H_2O and about 80% ethanol (solvent) with a first precursor compound $\text{La}(\text{NO}_3)_3 \cdot x\text{H}_2\text{O}$ and $\text{Mn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ and a second precursor compound SrNO_3 , and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

64. (Previously Presented) A method according to claim 37, wherein the material is Yttria Stabilised Zirconia (YSZ), and the material solution is manufactured by the steps of:

- (a) mixing propanol or butanol (solvent) with a first precursor compound $Y(O_2C_8H_{15})_3$ and a second precursor compound $Zr(OC_4H_9)_4$, and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

65. (Previously Presented) A method according to claim 37, wherein the material is Yttria Stabilised Zirconia (YSZ), and the material solution is manufactured by the steps of:

- (a) mixing propanol or butanol (solvent) with a first precursor compound $Y(O_2C_8H_{15})_3$ and a second precursor compound $Zr(OC_3H_7)_4$, and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

66. (Previously Presented) A method according to claim 37, wherein the material is NiO-YSZ, and the material solution is manufactured by the steps of:

- (a) mixing propanol (solvent) with a first precursor compound $Ni(NO_3)_2 \cdot 6H_2O$ and $Zr(OC_3H_7)_4$ and a second precursor compound $Y(O_2C_8H_{15})_3$, and
- (b) adding a catalyst to the mixture to provide a material solution of a required pH.

67. (Previously Presented) A method according to claim 37, wherein the film has a thickness between a nm and approximately 100 μm .

68. (Previously Presented) A method according to claim 37, wherein the step of pressure feeding the material solution comprises the step of pumping the material solution.

69. (Previously Presented) A method according to claim 37, wherein the temperature gradient is such that evaporation of the solvent from, and one or both of decomposition of and chemical reaction of, the droplets occurs as the droplets approach the surface of the substrate.

70. (Previously Presented) A method of depositing a material onto a substrate, the method comprising the steps of:

(a) feeding a material solution comprising one or more precursor compounds and a solvent to an outlet disposed opposite the substrate to provide a stream of droplets of the material solution;

(b) generating an electric field electrostatically to attract the droplets from the outlet towards the substrate; and

(c) providing a temperature gradient between the outlet and the substrate; wherein the feeding of the material solution, the electric field and the temperature gradient are configured such that the droplets one or both of decompose and react prior to reaching the substrate so as to form a powder.

71. (Previously Presented) A method of depositing a material onto a substrate, the method comprising the steps of:

feeding a material solution comprising one or more precursor compounds and a solvent to an outlet to provide a stream of droplets of the material solution;

generating an electric field electrostatically to attract the droplets from the outlet towards the substrate;

providing a temperature gradient between the outlet and the substrate;

cooling the material deposited on the substrate; and

maintaining the electric field for at least a part of the time during which the deposited material is cooled.

72. (Previously Presented) A method of depositing a material onto a substrate, the method comprising the steps of:

pressure feeding a material solution comprising one or more precursor compounds and a solvent from a material solution supply to an outlet;

generating an electric field between the outlet and a substrate disposed opposite the outlet to provide a corona spray of droplets of the material solution and electrostatically guide the droplets from the outlet towards a surface of the substrate; and

providing a decreasing temperature gradient from the surface of the substrate to the outlet.

73. (Previously Presented) A method of depositing a material onto a substrate, the method comprising the steps of:

(a) pressure feeding a material solution comprising one or more precursor compounds and a solvent to an outlet disposed opposite the substrate to provide a stream of droplets of the material solution;

(b) generating an electric field electrostatically between the outlet and a substrate to provide a corona spray of droplets and to attract the droplets from the outlet towards the substrate; and

(c) providing a decreasing temperature gradient between the outlet and the substrate; wherein the feeding of the material solution, the electric field and the temperature gradient are configured such that the droplets one or both of decompose and react prior to reaching the substrate so as to form a powder.

74. (Currently Amended) A method of depositing a material onto a substrate, the method comprising the steps of:

pressure feeding a material solution comprising one or more precursor compounds and a solvent to an outlet to provide a stream of droplets of the material solution;

generating an electric field electrostatically between the outlet and a substrate to provide a corona spray of droplets and to attract the droplets from the outlet towards the substrate;

providing ~~a decreasing~~ a decreasing temperature gradient between the outlet and the substrate;

cooling the material deposited on the substrate; and

maintaining the electric field for at least a part of the time during which the deposited material is cooled.